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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/633,873	08/04/2003	Stephen J. Hudgens	ITO.0048US (P16245)	5270

21906 7590 10/20/2006

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EXAMINER	
SEFER, AHMED N	

ART UNIT	PAPER NUMBER
2826	

DATE MAILED: 10/20/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/633,873	HUDGENS, STEPHEN J.	
	Examiner	Art Unit	
	A. Sefer	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) *1-10 and 26-30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In view of the appeal brief filed on 7/25/2006, PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 11-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Ichihara et al. ("Ichihara") US PG-Pub 2003/0152867.

Ichihara discloses (figs. 1-16 and pars. 115 and 243) a phase change material comprising: a chalcogenide 104/324; a species introduced (par. 567) into the chalcogenide material or

Ge.sub.2Sb.sub.2Te.sub.5 (**as in claim 12**) including nitrogen (**as in claim 14**); and a species including titanium (**as in claim 15**) introduced into the chalcogenide (par. 567).

Regarding claim 13, Ichihara discloses (par. 39) grains of the chalcogenide being **approximately** within the recited range.

4. Claims 11, 14 and 15 are rejected under 35 U.S.C. 102(e) as being anticipated by Mizuuchi et al. ("Mizuuchi") US PG-Pub 2006/0193231.

Mizuuchi discloses (fig. 1 and par. 105) a phase change material comprising: a chalcogenide 4; a species including nitrogen (**as in claim 14**) introduced into the chalcogenide material; and a species including titanium (**as in claim 15**) introduced into the chalcogenide.

5. Claims 16-22, 24 and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Ichihara.

Ichihara discloses (figs. 1-16 and pars. 8, 115 and 243) a device or a semiconductor memory (**as in claim 21**) comprising: a substrate 101; and a layer of chalcogenide material 104 including Ge.sub.2Sb.sub.2Te.sub.5 (**as in claim 17**) over said substrate, said chalcogenide material including a species including nitrogen (**as in claim 19**) and a species including titanium (**as in claim 20**) (par. 567).

Regarding claim 18, Ichihara discloses (par. 39) grains of the chalcogenide being **approximately** within the recited range.

Regarding claim 22, Ichihara discloses (pars. 214, 216 and 394) an insulator 102/103 over said substrate and under said chalcogenide material.

Regarding claim 24, Ichihara discloses (pars. 214, 216) titanium containing layer 103 under said chalcogenide material.

Regarding claim 25 Ichihara discloses titanium containing layer being sufficiently proximate to said chalcogenide material that titanium **may** diffuse -- a desired result rather than a structural limitation. See In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See also In re Swinehart, 439 F.2d210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971; In re Danly, 263, F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959) -- into the phase change material upon heating.

6. Claims 16, 19-22, 24 and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Mizuuchi.

Mizuuchi discloses (fig. 1 and abstract and pars. 3 and 105) a device or a semiconductor memory (**as in claim 21**) comprising: a substrate 1; and a layer of chalcogenide material 4 over said substrate, said chalcogenide material including nitrogen **(as in claim 19)**; and a species including titanium (**as in claim 20**).

Regarding claim 22, Mizuuchi discloses (par. 103) an insulator 2 over said substrate and under said chalcogenide material.

Regarding claim 24, Mizuuchi discloses (par. 104) titanium containing layer 3 under said chalcogenide material.

Regarding claim 25 Mizuuchi discloses titanium containing layer being sufficiently proximate to said chalcogenide material that titanium **may** diffuse -- a desired result rather than a structural limitation. See In re Schreiber, 128 F.3d 1473, 1477-78, 44 USPQ2d 1429, 1431-32 (Fed. Cir. 1997); See also In re Swinehart, 439 F.2d210, 212-13, 169 USPQ 226, 228-29 (CCPA 1971; In re Danly, 263, F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959) -- into the phase change material upon heating.

Note that although the prior art meets the claim limitations, applicant's recitation, "to increase crystallization speed"/"to reduce grain size" (claims 11 and 16) does not distinguish over the Ichihara/Mizuuchi reference regardless of the functions allegedly performed by the claimed device, because only the device per se is relevant, not the recited function. Furthermore, a functional language in a device claim is directed to the device per se, no matter which of the device's functions is referred to in the claim. See *In re Ludtke and Sloan*, 169 USPQ 563 at 567, and *In re Swinehart*, 169 USPQ 226, both of which make it clear that it is the patentability of the device per se which must be determined in a "functional language" claim and not the patentability of the function, and that an old or obvious device alleged to perform a new function is not patentable as a device, whether claimed in "functional language" terms or not. Note that the above case law makes it clear that in such cases applicant has the burden of showing that a prior art device that appears reasonably capable of performing the allegedly novel function is in fact incapable of doing so. See MPEP § 2114. See *In re Schreiber*, 44 USPQ2d 1429, 1432 (Fed. Cir. 1997) (Spout having "taper ... such as to by itself jam up the popped popcorn before the end of the cone and permit the dispensing of only a few kernels at a shake" anticipated by an oil can spout having the same shape as spout Applicant disclosed as being adapted for dispensing said only a few kernels at said shake) for a discussion of the roles of examiner and applicant in determining when and how functional limitations distinguish a claim from prior art disclosing the same structure. See also *In re King*, 231 USPQ 136 (Fed. Cir, 1986) ("It did not suffice merely to assert that Donley [the cited prior art] does not inherently achieve enhanced color through interference effects [the claimed function], challenging the PTO to

prove the contrary by experiment or otherwise. The PTO is not equipped to perform such tasks.") In this case it is reasonable to assume that Ichihara's or Mizuuchi's device is capable of increasing crystallization speed or reducing grain size, because similar to Applicant's device, species of titanium and nitrogen are introduced in the chalcogenide material. Because it is reasonable to assume that the device is capable of performing the claimed function, the burden shifts to Applicants to show that it is not. See MPEP § 2114.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ichihara in view of Horie et al. ("Horie") US PG-Pub 2003/0214857.

Ichihara discloses the device structure as recited in the claim, but fails to disclose a heater.

Horie discloses in fig. 4, a heater 4 extending through an insulator 10 to a chalcogenide material 3 to heat said chalcogenide material.

Therefore, it would have been obvious to one skilled din the art at the time the invention was made to modify Ichihara's device by incorporating a heater so as to carry out an initial crystallization of chalcogenide material as taught by Horie.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to A. Sefer whose telephone number is (571) 272-1921.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on (571) 272-1915.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ANS
October 11, 2006